## TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Date: 28-09-2018

| | | |
|---|---|---|
| **Lab ID** | : | CP-2017-06-15-04 |
| **Customer** | : | Assistant Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore. |
| **Address** | : | Shettyhalli Sub Division, BBMP, Bangalore. |
| **Project Name** | : | Construction of RCC Drains & CC Roads at Ayyappa Layout & Mathushree Layout in ward no.13 Shettyhalli Sub Division. |
| **Agency** | : | Technical Manager (west), KRIDL, Project Implementation Unit, No.280, 59th cross, 17th 'C' Main Road, 3rd 'Y' Block, Rajajinagara, Bangalore-560010 |
| **Customer's Reference** | : | BBMP/EE/DD/WO/103/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 26-09-2018 |
| **Sample ID No** | : | 2017-06-15-04/01 |
| **Sample Type** | : | Birla Super 53grade |
| **Reference to BIS codes** | : | IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,<br>IS 4031 (Part 1,2 3,4,5, 6,11):1988<br>IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4<br>IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5<br>IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6<br>IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5<br>IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5<br>IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6 |
| **Date of test** | : | 27-09-2018 |

| Sl.No. | Physical properties | Results | Requirement as per IS 12269: 2013 |
|---|---|---|---|
| 1 | Fineness by dry sieving (%) | 2.65 | – |
| 2 | Finess by Air permeablity method ($m^2$/kg, Min) | 289.5 | 225$m^2$/kg, Min |
| 3 | Density (gm/cc) | 3.12 | – |
| 4 | Standard Consistency (%) | 28.0% | Not specified |
| 5 | Initial Setting time | 145 minutes | Not less than 30 minutes |
| 6 | Final Setting time | 240 minutes | Not more than 600 minutes |
| 7 | Soundness (Le Chatelier's Method) | 1mm | Not more than 10 mm |

**Note:**

The results pertain to the samples received and tested.

All information furnished by Customer/Representative

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Samples will be disposed after 90 days from the date of issue of test certificate

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B.KARTHIK RECHAN
Authorized Signatory
Quality Manager

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## TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2017-06-15-04** **Date: 25-10-2018** |
| **Customer** | : | Assistant Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore. |
| **Address** | : | Shettyhalli Sub Division, BBMP, Bangalore. |
| **Project Name** | : | Construction of RCC Drains & CC Roads at Ayyappa Layout & Mathushree Layout in ward no.13 Shettyhalli Sub Division. |
| **Agency** | : | Technical Manager (west), KRIDL, Project Implementation Unit, No.280, 59th cross, 17th 'C' Main Road, 3rd 'Y' Block, Rajajinagara, Bangalore-560010 |
| **Customer's Reference** | : | BBMP/EE/DD/WO/103/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 26-09-2018 |
| **Sample ID No** | : | 2017-06-15-04/01 |
| **Sample Type** | : | Birla Super 53grade |
| **Reference to BIS codes** | : | IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification ,<br>IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5<br>IS 4031 Part 6, Determination of Compressive Strength, Clause 6 |
| **Date of test** | : | 27-09-2018 |

**Compressive Strength**

| Sl.No. | Physical properties | Results | Requirement as per IS 12269: 2013 |
|---|---|---|---|
| 1 | 3 Days | 27.5N/mm$^2$ | Not less than 27 N/mm$^2$ |
| 2 | 7 Days | 39.5N/mm$^2$ | Not less than 37 N/mm$^2$ |
| 3 | 28 Days | 57.5N/mm$^2$ | Not less than 53 N/mm$^2$ |

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## TEST REPORT ON COARSE AGGREGATES

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2017-06-15-04** **Date: 29-09-2018** |
| **Customer** | : | Assistant Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore. |
| **Address** | : | Shettyhalli Sub Division, BBMP, Bangalore. |
| **Project Name** | : | Construction of RCC Drains & CC Roads at Ayyappa Layout & Mathushree Layout in ward no.13 Shettyhalli Sub Division. |
| **Agency** | : | Technical Manager (west), KRIDL, Project Implementation Unit, No.280, 59th cross, 17th 'C' Main Road, 3rd 'Y' Block, Rajajinagara, Bangalore-560010 |
| **Customer's Reference** | : | BBMP/EE/DD/WO/103/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample condition** | : | Satisfactory |
| **Date of Receipt** | : | 25-09-2018 |
| **Sample ID No** | : | 2017-06-15-04-02(a) |
| **Sample Type** | : | 40mm down size coarse aggregate |
| **Reference to BIS codes** | : | IS: 383:2016 (Specification for Coarse and fine Aggregates )<br>IS: 2386 :1963(Part - 1,3,4) RA2011<br>IS 2386 Part 1: Particle Size and Shape<br>IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption<br>IS 2386 Part 4: Mechanical Properties |
| **Date of test** | : | 26-09-2018 |

**SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:**

**Total weight taken** : **15000** **grams**

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|---|---|---|---|---|---|---|
| 1 | 80 mm | 0 | 0 | 0.0 | 100 | 100 |
| 2 | 40 mm | 321 | 321 | 2.1 | 97.9 | 90-100 |
| 3 | 20 mm | 5663 | 5984 | 39.9 | 60.1 | 30-70 |
| 4 | 10 mm | 4536 | 10520 | 70.1 | 29.9 | 10-35 |
| 5 | 4.75 mm | 4153 | 14673 | 97.8 | 2.2 | 0-5 |
| 6 | Pan | 327 | 15000 | 100.0 | 0 | --- |

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## TEST REPORT ON COARSE AGGREGATES

**Lab ID** : **CP-2017-06-15-04** **Date: 29-09-2018**

**Sample ID No** : 2017-06-15-04-02(a)

**PHYSICAL PROPERTIES**

| Sl.no | Tests | Result | Requirements as per IS:383-2016 |
|---|---|---|---|
| 1 | Flakiness Index(%) | 12.6 | Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate |
| 2 | Elongation Index(%) | 11.8 | |
| 3 | Specific Gravity | 2.67 | – |
| 4 | Bulk Density(Loose) (Kg/l) | 1.51 | – |
| 5 | Bulk Density(Compacted) (Kg/l) | 1.53 | – |
| 6 | Water Absorption(%) | 0.24 | – |

**Note:**
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## TEST REPORT ON COARSE AGGREGATES

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2017-06-15-04** **Date: 29-09-2018** |
| **Customer** | : | Assistant Executive Engineer, Shettyhalli Sub Division, BBMP, |
| **Address** | : | Shettyhalli Sub Division, BBMP, Bangalore. |
| **Project Name** | : | Construction of RCC Drains & CC Roads at Ayyappa Layout & Mathushree Layout in ward no.13 Shettyhalli Sub Division. |
| **Agency** | : | Technical Manager (west), KRIDL, Project Implementation Unit, No.280, 59th cross, 17th 'C' Main Road, 3rd 'Y' Block, Rajajinagara, Bangalore-560010 |
| **Customer Reference** | : | BBMP/EE/DD/WO/103/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 25-09-2018 |
| **Sample ID No** | : | 2017-06-15-04-02(b) |
| **Sample Type/ Size** | : | 20mm down size coarse aggregate |
| **Reference to BIS codes** | : | IS: 383:2016 (Specification for Coarse and fine Aggregates )<br>IS: 2386 :1963(Part - 1,3,4) RA2011<br>IS 2386 Part 1: Particle Size and Shape<br>IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption<br>IS 2386 Part 4: Mechanical Properties |
| **Date of test** | : | 26-09-2018 |

**SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:**

**Total weight taken** : **5000** **grams**

| Sample No. | Sieve No. | Weight Retained in gms | Cumulative Weight Retained in gms | % Cumulative Weight Retained | % Passing | Required as per IS 383:2016 |
|---|---|---|---|---|---|---|
| 1 | 40 mm | 0 | 0 | 0 | 100 | 100 |
| 2 | 20 mm | 254 | 254 | 5.1 | 94.9 | 90-100 |
| 3 | 10 mm | 2435 | 2689 | 53.8 | 46.2 | 25-55 |
| 4 | 4.75 mm | 1989 | 4678 | 93.6 | 6.4 | 0-10 |
| 5 | Pan | 322 | 5000 | 100 | 0 | _ |

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## TEST REPORT ON COARSE AGGREGATES

**Lab ID** : **CP-2017-06-15-04** **Date: 29-09-2018**

**Sample ID No** : 2017-06-15-04-02(b)

### PHYSICAL PROPERTIES

| Sl.no | Tests | Result | Requirements as per IS:383-2016 |
|---|---|---|---|
| 1 | Flakiness Index(%) | 12.5 | Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate |
| 2 | Elongation Index(%) | 11.8 | |
| 3 | Specific Gravity | 2.66 | – |
| 4 | Bulk Density(Loose) (Kg/l) | 1.46 | – |
| 5 | Bulk Density(Compacted) (Kg/l) | 1.49 | – |
| 6 | Water Absorption(%) | 0.23 | – |
| 7 | Aggregate crushing Value(%) | 22.5 | Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface. |
| 8 | Aggregate Impact Value(%) | 21.7 | 30% for Aggregates to be used in concrete for wearing Surface,<br>45% for Aggregates to be used in concrete other than for wearing Surface. |

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**R KARTHIK RECHAN**
Authorized Signature
**Quality Manager**

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# TEST REPORT OF FINE AGGREGATE

| | | |
|---|---|---|
| **Lab ID** | : | **CP-2017-06-15-04** **Date: 29-09-2018** |
| **Customer** | : | Assistant Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore. |
| **Address** | : | Shettyhalli Sub Division, BBMP, Bangalore. |
| **Project Name** | : | Construction of RCC Drains & CC Roads at Ayyappa Layout & Mathushree Layout in ward no.13 Shettyhalli Sub Division. |
| **Agency** | : | Technical Manager (west), KRIDL, Project Implementation Unit, No.280, 59th cross, 17th 'C' Main Road, 3rd 'Y' Block, Rajajinagara, Bangalore-560010 |
| **Customer's Reference** | : | BBMP/EE/DD/WO/103/2017-18 |
| **Source of Sample** | : | Sample supplied by Agency |
| **Sample Condition** | : | Satisfactory |
| **Date of Receipt** | : | 25-09-2018 |
| **Sample ID No** | : | 2017-06-15-04-03 |
| **Sample Type** | : | Fine Aggregate |
| **Reference to BIS codes** | : | IS 383 : 2016 (Specification for Coarse and fine Aggregates)<br>IS: 2386 :1963(Part - 1, 3) RA2012<br>IS 2386 Part 1: Particle Size and Shape<br>IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption |
| **Date of test** | : | 26-09-2018 |
| **Total weight taken** | : | 1000 grams |

| Sl.no | Sieve Size | Weight Retained (gms) | Cumulative Weight Retained (gms) | % Cumulative Weight Retained | % Passing | Requirement as per IS 383:2016 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Grading Zone I | Grading Zone II | Grading Zone III | Grading Zone IV |
| 1 | 10 mm | 0 | 0 | 0.0 | 100.0 | 100 | 100 | 100 | 100 |
| 2 | 4.75 mm | 83 | 83 | 8.3 | 91.7 | 90-100 | 90-100 | 90-100 | 95-100 |
| 3 | 2.36 mm | 134 | 217 | 21.7 | 78.3 | 60-95 | 75-100 | 85-100 | 95-100 |
| 4 | 1.18 mm | 166 | 383 | 38.3 | 61.7 | 30-70 | 55-90 | 75-100 | 90-100 |
| 5 | 600 micron | 179 | 562 | 56.2 | 43.8 | 15-34 | 35-59 | 60-79 | 80-100 |
| 6 | 300 micron | 187 | 749 | 74.9 | 25.1 | 5-20 | 8-30 | 12-40 | 15-50 |
| 7 | 150 micron | 154 | 903 | 90.3 | 9.7 | 0-10 | 0-10 | 0-10 | 0-15 |
| 8 | Pan | 97 | 1000 | 100.0 | 0.0 | --- | --- | --- | --- |

**Result :The tested Sample Conforms to Grading Zone II**

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# TEST REPORT OF FINE AGGREGATE

**Lab ID** : **CP-2017-06-15-04** **Date: 29-09-2018**

**Sample ID No** : 2017-06-15-04-03

## PHYSICAL PROPERTIES

| Sl.no | Tests | Result | Requirements as per IS 383:2016 |
|---|---|---|---|
| 1 | Water Absorption(%) | 1.65 | – |
| 2 | Specific Gravity | 2.56 | – |
| 3 | Material finer than 75 micron(%) | 4.8 | Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10% |

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Authorized Signatory
**Quality Manager**

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